Knowledge Management and

Learning Systems

## Aims

This course aims to introduce a wide range of methods and techniques that are currently used and researched in knowledge management systems and applications that are based on knowledge of human understanding.

## Learning Outcomes

### Knowledge and Understanding

Having successfully completed the course, you will be able to demonstrate knowledge and understanding of:

* Identify the distinction between computational methods in general and knowledge-based technologies;
* Understand the differences in approaches to knowledge representation;
* Understand the techniques for acquiring domain knowledge;
* Relate methodologies and techniques to a range of practical applications.

## Topics Covered

#### Knowledge Representation

* Ontologies
* Logic: propositional, predicate, description
* Semantic networks, frames, scripts, rules
* Uncertainty: certainty factors, fuzzy logic

### Knowledge Acquisition and Modeling

* Elicitation: card-sort, repertory grids
* Structured Knowledge Engineering

### Information Retrieval

* Boolean searches
* Vector space model
* Term selection and weighting
* Query refinement
* Evaluation: precision and recall

## Methods of assessment

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| --- | --- | --- |
| **Assessment method** | **Number** | **% contribution to final mark** |
| Examination [final and midterms] | 3 | 60 |
| Coursework | 1 | 40 |

## Week wise course description

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| --- | --- |
| **Week No** | **Topic** |
| 1 | Introduction to Knowledge Management |
| 2 | Service Oriented Architecture (SOA) |
| 3 | XML, DTD, and Schema |
| 4 | Resource Description Framework (RDF) |
| 5 | Introduction to Ontologies |
| 6 | Introduction to Protégé |
| 7 | SPARQL and Protégé |
| 8 | Ontologies and VLEs |
| 9 | Converting VLEs into PLEs |
| 10 | Question and Test Interoperability Specification |
| 11 | Learning Object Models (LOM) |
| 12 | Learning with Disability |
| 13 | Learning through Games |
| 14 | Security and other associated features of learning |

## Resources

### Background Resources

* Research papers from IEEE Explore and ACM Digital Libraries
* Gilbert, LH, & Gale (2008) Principles of E-Learning Systems Engineering. Chandos. ISBN 1843342901.
* Service Oriented Computing: Semantics, Processes, Agents, by Singh and Huhns, Wiley ISBN 0470091487
* Alessi, SM, & Trollip, SR (1991). Computer-Based Instruction: Methods and Development (2nd ed). Prentice Hall.
* Bloom, BS, et al. (1956). Taxonomy of Educational Objectives. Longmans.
* Bloom, BS, Hastings, JT, & Madaus, GF. (1971). Handbook of Formative and Summative Evaluation of Student Learning. McGraw-Hill.
* Burns, H, Parlett, JW, & Redfield, CL (Eds) (1991). Intelligent Tutoring Systems. Lawrence Erlbaum Associates.
* John F. Sowa, Knowledge Representation: Logical, Philosophical, and Computational Foundations, Brooks Cole Publishing Co., 2000